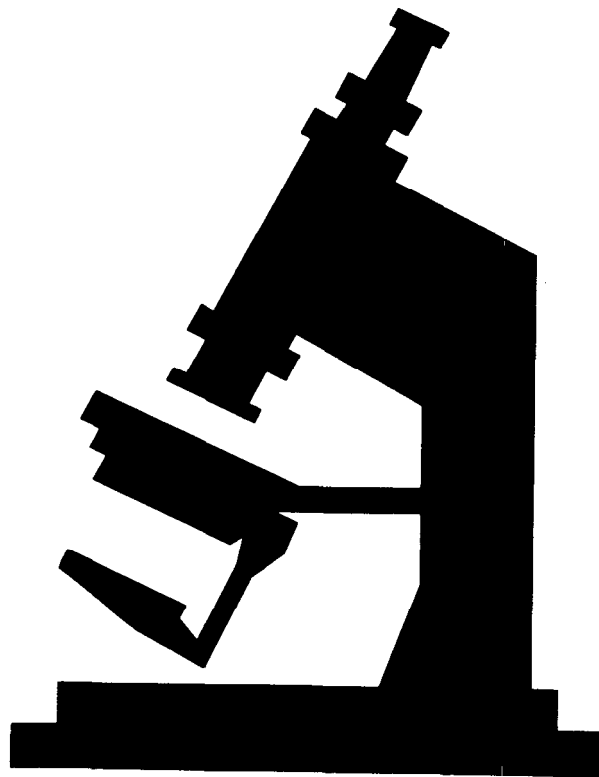


INTERMEDIATE SCIENCE RELEASED ITEMS



Missouri Assessment Program
Spring 1999

SESSION I

CONSTRUCTED RESPONSE

1. List two properties of the atmosphere that are observed and measured to provide data for forecasting the weather.

a. _____

b. _____

For each property you listed, explain how the data obtained from observations and measurements can be used to help forecast the weather.

b. _____

2. In 1882, German biologist **Walther** Flemming discovered that chromosomes are present in the cells of all plants and animals.

What is the primary role of chromosomes in plants and animals?

SESSION II

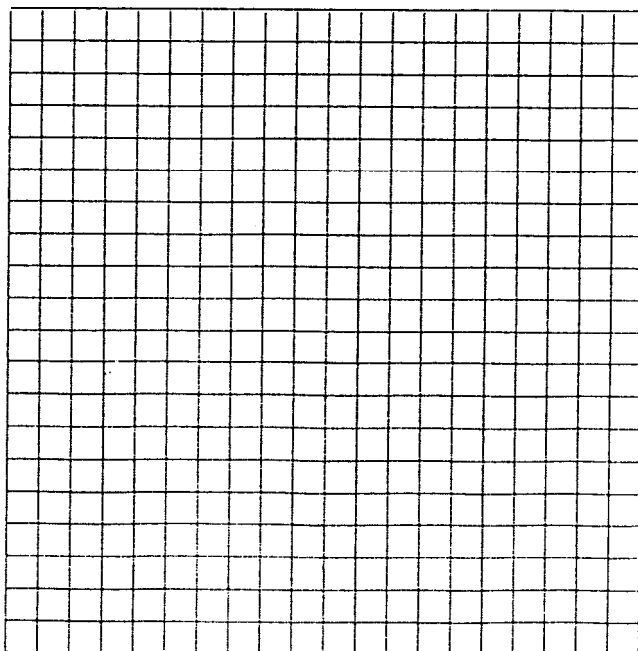
CALCIUM CHLORIDE

The following data table displays information about the effect of calcium chloride on the temperature of water. Containers A through D each contain 100 ml of water. Study the table. Then do Items number 3-6.

Containers (100 ml water in each)	Amount of Calcium Chloride Added to Water	Increase in the Temperature of Water in Degrees Celsius
A	25 grams	4
B	50 grams	8
C	75 grams	14
D	100 grams	22



3. a. Construct a line graph below using all the information in the data table. Be sure to provide labeled axes with number scales for your graph. Give the graph a title.



- b. Using the information in the table and on your graph , write an appropriate conclusion regarding the effect of calcium chloride on the temperature of water.

4. Based on the information in the data table, a local highway department is considering using calcium chloride to melt ice on the roads in the winter. However, there are questions about the effects of calcium chloride that should be answered before the final decision. is made.

Your task is to write such a question. Be sure your question is testable using scientific procedures.

- [illegible]

6. Create a chart in the space below that could be used to display the data collected during your investigation. Be sure to label rows and columns appropriately.

SCORING GUIDE

SESSION I:

1. **Four points**—one for each property listed and one for each matching explanation

Possible answers:

Wind speed can be used to predict when weather might change.

Wind direction can be used to predict temperatures (and approach of air masses and/or precipitation).

Air pressure/change in air pressure can be used to predict if weather will be clear and stable or stormy with precipitation and possible severe weather or if weather will be fair and calm.

Cloud type can be used to predict the approach of different kinds of weather.

Clouds/sky coverage can be used to predict temperatures or precipitation.

Temperature/change in temperature can be used to forecast movement of warm and cold fronts.

Humidity/dew point can be used to predict precipitation chances or whether fog will form.

Precipitation type and/or amount can be used to forecast dry or humid conditions.

Any response indicating a property of the atmosphere observed and measured to predict weather changes and an appropriate explanation of the use of that property in forecasting the weather.

2. One **point**

Possible answers:

Chromosomes carry the heredity information (genes/DNA)

Chromosomes are the heredity material.

Chromosomes carry the information for traits.

Chromosomes code for different traits.

SESSION II:

3. **Five points**—one for each of the following:

⇒ One axis labeled with the amount of calcium chloride and the other axis labeled with the temperature/temperature change.

⇒ Number scales indicated with correct intervals.

⇒ Line graph with data accurately plotted.

- ⇒ Title: “Amount of Calcium Chloride in Water and Water Temperature” or an equivalent of this title.
- ⇒ Conclusion: The greater the amount of calcium chloride added to water, the greater the temperature (or an equivalent of this.)

4. **Three** points—one for each of the following:

- ⇒ Stated in the form of a question relevant to the prompt.
- ⇒ Leads to attaining measurable/objective data (if the first point is not awarded, give no credit for this one)
- ⇒ Question focuses on a possible effect of calcium chloride on road surface, roadside plants, tires, vehicles, etc.

5. **Four points—one** for each of the following:

- ⇒ Procedures include three or more steps that are logical and appropriate for answering the question.
- ⇒ Materials needed are included.
- ⇒ Procedure provides a qualitative outline such that a knowledgeable person could conduct an experiment.
- ⇒ Procedure shows evidence of some pertinent quantification and some specificity.

(Training note: Procedure must address question student posed to get credit. Materials needed are reagents/expendables. Standard lab materials can be assumed included. “Gathering materials” is not a step; “multiple trials” is a step.)

6. Two **points---one** for each of the following:

- ⇒ Any layout of labeled cells.
- ⇒ Appropriate for written procedure of Item 5.